

CLAIMS

What is claimed is:

- Sub A'*
- 1 1. A metallurgical structure comprising:
- 2 a passivation layer;
- 3 a via through said passivation layer extending to a metal line within said
- 4 metallurgical structure;
- 5 a barrier layer lining said via;
- 6 a metal plug in said via above said barrier layer, said metal plug and said
- 7 metal line comprising a same material; and
- 8 a solder bump formed on said metal plug.

- 1 2. The metallurgical structure in claim 1, wherein said same material
- 2 comprises copper.

- Sub A'*
- 1 3. The metallurgical structure in claim 1, wherein said barrier layer
- 2 comprises one or more layers of Ti, TiN, Ta, and TaN.

1 4. The metallurgical structure in claim 1, wherein said barrier layer and said
metal plug prevent elements within said solder bump from diffusing to said metal
3 line.

1 5. The metallurgical structure in claim 1, wherein said metal plug, said
2 barrier layer and said passivation layer form a planar exterior surface of said
3 metallurgical structure.

1 6. The metallurgical structure in claim 1, wherein said solder ball is in direct
2 contact with said metal plug.

1 7. The metallurgical structure in claim 1, further comprising a second barrier
2 layer above said metal plug and a second metal plug above said second barrier
3 layer, said second metal plug being in direct contact with said solder ball.

1 8. An integrated circuit structure comprising:
2 internal components within an exterior covering;
3 a via extending through said exterior covering to said internal components;
4 a barrier layer lining said via;
5 a plug in said via above said barrier layer, said plug and said internal
6 components comprising a same material; and

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a connector formed on said plug.

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9. The integrated circuit structure in claim 8, wherein said same material
2 comprises copper.

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10. The integrated circuit structure in claim 8, wherein said barrier layer
comprises one or more layers of Ti, TiN, Ta, and TaN.

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11. The integrated circuit structure in claim 8, wherein said barrier layer and
2 said plug prevent elements within said connector from diffusing to said
3 components.

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12. The integrated circuit structure in claim 8, said plug, said barrier layer and
2 said exterior covering form a planar exterior surface of said integrated circuit
3 structure.

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13. The integrated circuit structure in claim 8, wherein said connector is in
direct contact with said plug.

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1 14. The integrated circuit structure in claim 8, further comprising a second
2 barrier layer above said plug and a second plug above said second barrier layer,
said second plug being in direct contact with said connector.

1 15. A method of forming an integrated circuit structure comprising:
2 forming a via through an exterior of said integrated circuit structure to
3 internal components of said integrated circuit structure;
4 lining said via with a barrier layer,
5 forming a plug above said barrier layer, said plug and said internal
6 components comprising a same material; and
7 forming a connector on said plug.

1 16. The method in claim 15, wherein said same material comprises copper.

1 17. The method in claim 15, wherein said barrier layer comprises one or more
2 layers of Ti, TiN, Ta, and TaN.

1 18. The method in claim 15, wherein said barrier layer prevents elements
2 within said connector from diffusing to said internal components.

1 19. The method in claim 15, further comprising polishing said integrated
2 circuit structure such that said plug, said barrier layer and said exterior form a
3 planar surface.

Sub 7
1 20. The method in claim 15, wherein said connector is formed to be in direct
2 contact with said plug.

1 21. The method in claim 15, further comprising forming a second barrier layer
2 above said plug and forming a second plug above said second barrier layer, such
3 that said second plug is in direct contact with said connector.

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